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UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS
DIVISION OF AGRICULTURAL ENGINEERING.

S. H. McCrory, Chief

MONTHLY NEWS LETTER

WASHINGTON, D.C., FEBRUARY 20, 1926.

FROM THE SECRETARY TO MR. MacDONALD:

"THERE IS NOTHING WHICH HAS GIVEN ME GREATER SATISFACTION DURING THE PAST YEAR THAN THE EFFICIENCY AND SPIRIT WITH WHICH THE MEMBERS OF THE DEPARTMENT OF AGRICULTURE HAVE CARRIED FORWARD THE WORK OF SERVING THE FARMING INTERESTS OF THE NATION. I WANT YOU AND THE MEMBERS OF YOUR BUREAU TO KNOW THAT I THOROUGHLY APPRECIATE WHAT HAS BEEN ACCOMPLISHED AND THAT YOU HAVE MY BEST WISHES FOR A NEW YEAR FULL OF PROSPERITY, SATISFACTION, AND PRIDE IN THE COMPETENCE AND USEFULNESS OF YOUR WORK."

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AS SECRETARY OF THE COUNCIL, MR. McCRORY ATTENDED THE FIRST MEETING OF THE ADVISORY COUNCIL, APPOINTED BY SECRETARY JARDINE TO COOPERATE WITH THE DIVISION ON THE FARM EQUIPMENT RESEARCH PROJECT WHICH PROFESSOR DAVIDSON, OF IOWA STATE COLLEGE, IS HEADING. THE MEETING WAS HELD AT CHICAGO FEBRUARY 16 - 17 AND WAS FOLLOWED, ON FEBRUARY 18 - 19 BY THE NATIONAL FARM HOMES CONFERENCE, SPONSORED BY THE AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS. THE FARM HOMES CONFERENCE REPRESENTS A MOVEMENT TO BETTER THE FARMERS' HOUSING SITUATION. M. C. BETTS PRESENTED A PAPER AT THIS MEETING. MR. McCRORY ALSO REMAINED OVER TO ATTEND A MEETING, ON FEBRUARY 20, OF COMMITTEE C-6, AMERICAN SOCIETY FOR TESTING MATERIALS, WHICH COMMITTEE IS CHARGED WITH THE MATTER OF SPECIFICATIONS FOR DRAIN TILE.

IN THE NOVEMBER ISSUE OF THE NEWS LETTER, REFERENCE WAS MADE TO UNUSUAL RAINFALL, NOVEMBER 3 - 6, IN CENTRAL MISSISSIPPI AND SOUTHEASTERN ARKANSAS. THIS RANGED FROM 8 TO 11 INCHES IN THE AREA ON WHICH B. S. CLAYTON IS CONDUCTING RUN-OFF INVESTIGATIONS. MR. CLAYTON HAS DETERMINED THE MEASURED DISCHARGE AT HEADS, MISS., TO HAVE BEEN, DURING THAT PERIOD, AT THE RATE OF 7300 SECOND-FOOT FOR THE WATERSHED AREA OF 463 SQUARE MILES. THIS IS EQUIVALENT TO A DEPTH OF .59 INCH IN 24 HOURS. THERE IS CONSIDERABLE STORAGE ABOVE THE MEASURING STATION WHICH, IN THE OPINION OF MR. CLAYTON, PREVENTED A MUCH LARGER RATE.

ON JANUARY 28, DR. JOHN A. WIDTSOE, CHAIRMAN OF THE FINANCIAL INVESTIGATING COMMITTEE APPOINTED BY THE SECRETARY OF THE INTERIOR, VISITED THE BERKELEY OFFICE AND HELD AN INFORMAL CONFERENCE WITH MEMBERS OF THE FORCE. SOME OF THE LEADING POINTS OF DR. WIDTSOE'S DISCUSSION ARE SUMMARIZED AS FOLLOWS:

IN THE EAST AND SOUTH THERE IS VERY DEFINITE OPPOSITION TO FURTHER FEDERAL RECLAMATION IN THE WEST ON A LARGE SCALE, THE FEELING BEING THAT

RECLAMATION IS A NATION-WIDE MATTER AND THAT NOW THE EAST AND SOUTH ARE IN THEIR TURN ENTITLED TO FEDERAL AID IN RECLAIMING SWAMP, OVER-FLOW, ERODED AND OTHERWISE WASTE LAND. WHILE SYMPATHIZING WITH THIS POINT OF VIEW, THE WEST NEVERTHELESS SHOULD CONTINUE TO HAVE THE GREATEST AID; FOR DENSELY POPULATED ATLANTIC AND PACIFIC SEABOARDS WITH A PARTIALLY DEVELOPED TERRITORY BETWEEN WILL MEAN A POORLY BALANCED NATION. FOR THE NEXT 10 YEARS NO NEW LARGE FEDERAL PROJECT SHOULD BE UNDERTAKEN, BUT AFTER THE COMPLETION OF PRESENT GOVERNMENT PROJECTS AID SHOULD BE DEVOTED TO PARTIALLY DEVELOPED PRIVATE PROJECTS WHERE THE SETTLERS ARE ALREADY ON THE LAND AND HAVE GONE AS FAR AS THEY CAN TOWARD COMPLETION OF THE WORK. FEDERAL LOANS COULD BE SECURED BY WATER RIGHTS, IRRIGATION WORKS, AND LAND.

THE BASING OF RATES OF REPAYMENT UPON THE CROP-PRODUCING POWER OF THE LAND IS THE ONE BIG CONTRIBUTION MADE BY THE FACT FINDING COMMITTEE. THE FIGURE, 5% OF THE GROSS ANNUAL INCOME, WAS NOT ADOPTED BY GUESS, BUT WAS TAKEN BECAUSE ANALYSIS OF RETURNS ON A NUMBER OF PROJECTS SHOWED THAT DELINQUENCIES RESULTED WHEN THE ANNUAL PAYMENT EXCEEDED 5% OF THE GROSS INCOME AND THAT PAYMENTS WERE MADE WITHOUT DIFFICULTY WHEN THEY FELL BELOW THAT PERCENTAGE. TO MEET THE OBJECTION THAT THIS ARRANGEMENT WOULD MAKE ANY PROJECT FEASIBLE IF A LONG ENOUGH TIME WERE GIVEN IT TO PAY OUT, THE POLICY PROBABLY WILL BE TO BASE THE RATE OF REPAYMENT UPON THAT FIGURE, WITH A MAXIMUM NUMBER OF YEARS, SAY 40, IN WHICH PAYMENTS MUST BE COMPLETED.

THE IRRIGATION FARMER SHOULD BE A CROP SPECIALIST. HE SHOULD PRODUCE SOMETHING WHICH CAN BE PRODUCED ONLY UNDER IRRIGATION AND THUS CONTROL THE MARKET FOR HIS PRODUCT. BUT HE SHOULD NOT STAKE ALL UPON HIS SPECIALTY. LET HIM PUT 20% OF HIS LAND IN THE SPECIALIZED CROP, AND ROTATE IT AROUND THE FARM. THIS WILL PREVENT DEPLETION OF SOIL FERTILITY AND OTHER INJURIES TO THE SOIL, AND AT THE SAME TIME PROVIDE SOME INSURANCE AGAINST A DEPRESSED MARKET.

R. G. HEMPHILL HAS MADE PRELIMINARY COMPUTATIONS OF THE SILT DISCHARGE AT VARIOUS MAIN RIVER STATIONS IN THE BRAZOS DRAINAGE OF TEXAS. BY CONVERTING FROM WEIGHT TO VOLUME ON THE BASIS OF 85 POUNDS OF DRY SILT TO THE CUBIC FOOT OF WET SILT IN PLACE, THE FOLLOWING RELATIONSHIP BETWEEN DRAINAGE AREA AND SILT DISCHARGE WAS OBTAINED:

STATION	DRAINAGE AREA SQUARE MILES.	ACRE-FEET SILT PER SQUARE MILE PER ANNUM.
SEYMOUR	14,500	.364
MINERAL WELLS	23,100	.350
GLENROSE	24,837	.290
WACO	28,498	.253

THIS CONVERSION BASIS WAS OBTAINED BY AVERAGING A NUMBER OF TESTS MADE ON RIVER-BED BARS AND IS NO DOUBT SOMEWHAT HIGH, AS THESE BARS CONTAIN MORE SAND AND LESS FINE MATERIAL THAN IS CARRIED IN SUSPENSION BY THE STREAM. THE RESULTS SHOWED AN APPARENT LOSS OF WATER AND SILT BETWEEN MINERAL WELLS AND GLENROSE, THE SILT LOSS PROBABLY BEING OCCASIONED BY A TEMPORARY DEPOSIT IN THE BED OF THE STREAM WHICH WILL BE MOVED DOWNSTREAM DURING THE NEXT VERY HIGH FLOOD, OR BY BUILDING UP THE FLOOD PLAIN BETWEEN THE TWO POINTS.

L. T. JESSUP REPORTS THAT A FEW DRAINAGE DISTRICTS IN YAKIMA COUNTY, WASHINGTON, ARE USING A SMALL MOTOR BOAT FOR CLEANING DRAINAGE DITCHES. SEVERAL MEN WITH ROPES OR A WINDLASS AND CABLE ARE EMPLOYED TO DRAW THE BOAT BACKWARDS DOWNSTREAM. THE PROPELLER, IN ATTEMPTING TO FORCE THE BOAT UP-STREAM, STIRS UP THE SILT AND STARTS IT AND SMALL DEBRIS IN THE OPPOSITE DIRECTION. THE COST PER LINEAR FOOT OF CHANNEL HAS VARIED FROM 3 TO 10 CENTS AND THE COST PER CUBIC YARD FROM 11 TO 45 CENTS. A CHANGE IS NOW BEING TRIED BY REVERSING THE PROPELLER. THUS THE BOAT TENDS TO MOVE BACKWARD DOWN-STREAM AND TWO MEN WITH ROPES ARE USED TO PREVENT ITS MOVING TOO RAPIDLY AND TO DIRECT THE PROPELLER INTO THE SILT BARS WHICH ARE CUT OUT RAPIDLY. AN OLD FORD ENGINE IS USED. WHILE THE REVERSED PROPELLER TENDS TO THROW SOME OF THE SILT FORWARD IT APPEARS THAT ABOUT AS MUCH SILT IS STARTED DOWNSTREAM AS WITH THE OTHER METHOD AND TWO TRIPS ARE USUALLY NECESSARY IN EITHER CASE. WITH THE REVERSED PROPELLER LESS LABOR IS REQUIRED.

THE OBJECT OF A TEST NOW BEING CONDUCTED BY W. V. HUKILL, JUNIOR REFRIGERATION TECHNICIAN, AT LOS ANGELES, CALIF., IS TO FIND THE RELATION OF HEAT CONDUCTIVITY THROUGH THE FLOORS OF REFRIGERATOR CARS TO THE AMOUNT OF MOISTURE IN THE INSULATING MATERIAL. THERMOCOUPLES ARE USED TO MEASURE THE TEMPERATURE DIFFERENCES BETWEEN THE TOP AND BOTTOM SURFACES OF THE FLOORS, AND CONDUCTIMETER PLATES TO MEASURE THE HEAT FLOW THROUGH THE FLOORS. THE PLATES WERE MADE BY G. F. TAYLOR OF THE BUREAU OF PLANT INDUSTRY AND CALIBRATED BY THE BUREAU OF STANDARDS IN B.T.U. PER HOUR PER SQUARE FOOT OF SURFACE. THE PLATES ARE PLACED ON THE UPPER SURFACE OF THE FLOOR. THERMOCOUPLES ARE SUNK IN BOTH THE UPPER AND LOWER SURFACE OF THE FLOOR DIRECTLY BENEATH THE PLATES. THUS THE READING FROM THE PLATE GIVES THE B.T.U. PER HOUR PER SQUARE FOOT GOING THROUGH THE FLOOR AND THE THERMOCOUPLES GIVE THE DIFFERENCE IN TEMPERATURE BETWEEN THE TWO SURFACES OF THE FLOOR. READINGS OF THE THERMOCOUPLES AND PLATES ARE TAKEN WITH A POTENTIOMETER EVERY TWO HOURS FOR FOUR OR FIVE DAYS. FROM THESE FIGURES THE AVERAGE HEAT FLOW PER DEGREE DIFFERENCE IN SURFACE TEMPERATURES MAY BE OBTAINED. THE TEMPERATURES INSIDE OF THE CAR AND UNDER IT ARE CONTROLLED TO INSURE A CONTINUOUS FLOW OF HEAT IN ONE DIRECTION. SAMPLES OF THE INSULATION ARE TAKEN FROM EACH CAR TESTED AND THE MOISTURE CONTENT MEASURED. THEN THE RELATION BETWEEN CONDUCTIVITY OF THE FLOOR AND MOISTURE CONTENT OF THE INSULATING MATERIAL IS DETERMINED.

CORROSION IS OF INTEREST TO ENGINEERS AND FARMERS ALIKE BECAUSE THIS SAME AGENCY DESTROYS METAL HOOPS OF STAVE PIPE, METAL PIPE AND OTHER FITTINGS IN THE SAME WAY THAT IT DESTROYS FENCE WIRE. THE TENDENCY OF IRON AND STEEL TO RUST OR OXIDIZE IS A CHARACTERISTIC OF THE METAL ITSELF. CAST IRON IS PRESERVED BY A COATING OF RUST AND EXPERIENCE HAS SHOWN THAT WROUGHT IRON RESISTS OXIDATION BETTER THAN STEEL. FROM TEST DATA IT IS OBSERVED THAT STEEL FENCE WIRE CONTAINING COPPER IS AS DURABLE AS WROUGHT IRON.

A. S. CUSHMAN, IN FARMERS' BULLETIN No. 239, "CORROSION OF FENCE WIRE," DISCUSSES THE VALUE OF WROUGHT IRON AND STEEL WIRE AND ALSO GIVES A TEST FOR DETERMINING THE THICKNESS OF SPELTER.

O. W. STOREY, IN A BULLETIN "THE CORROSION OF COPPER-STEEL FENCE WIRE," PUBLISHED BY C.F. BURGESS LABORATORIES, MADISON, WIS., GIVES DATA ON THE CORROSION OF COPPER-STEEL WIRE.

INFORMATION SERIES No. 28, "FENCES", ABSTRACTS FARMERS'
BULLETIN No. 230 AND CONTAINS OTHER INFORMATION
REGARDING FENCING.

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GUY ERVIN HAS RECENTLY COMPILED A PARTIAL BIBLIOGRAPHY ON THE SUBJECT
OF TILE DRAINAGE. THE PARTICULAR PURPOSE FOR WHICH THE LIST WAS COMPILED
MADE IT DESIRABLE TO OMIT THE OLDER REFERENCES. THIS BIBLIOGRAPHY WILL
APPEAR IN INSTALLMENTS IN THE NEWS LETTER.

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BURDICK, R. T.

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(TO BE CONTINUED)

